

# A Multi-Scale Modeling & Data Assimilation System to Support SPURS & Study Upper Ocean Salinity Processes

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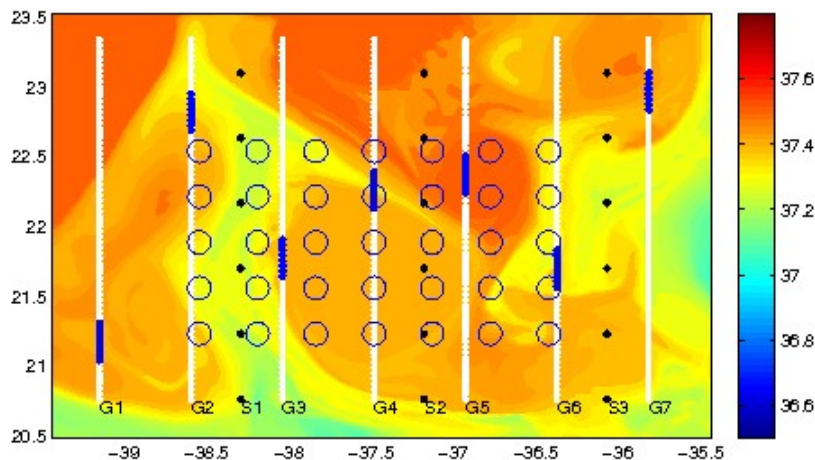
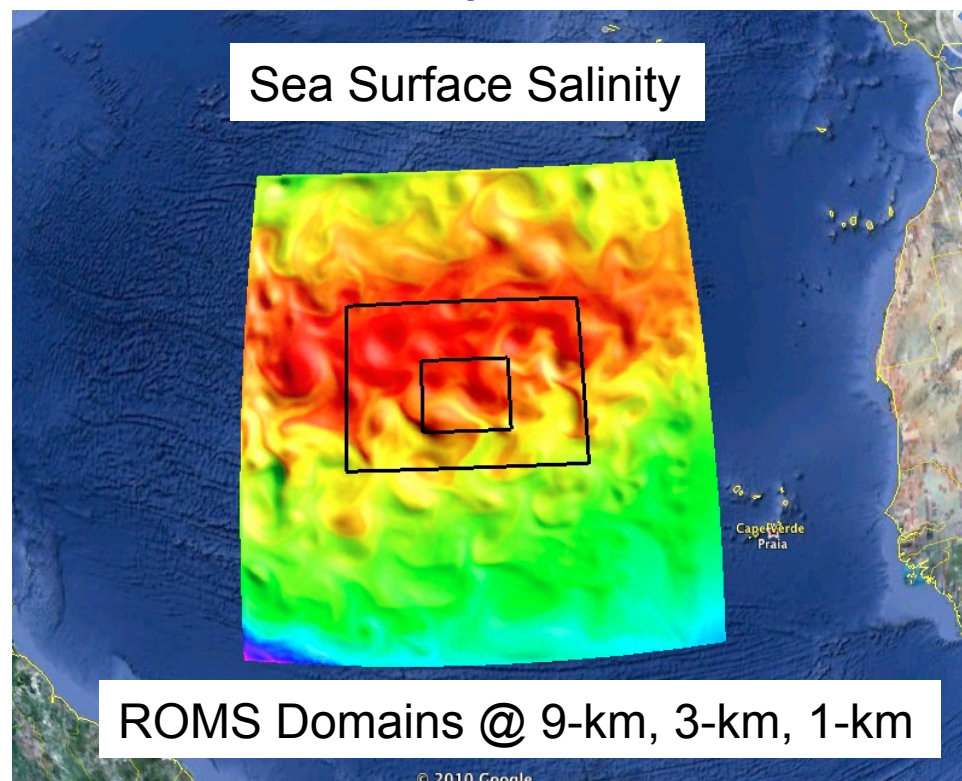
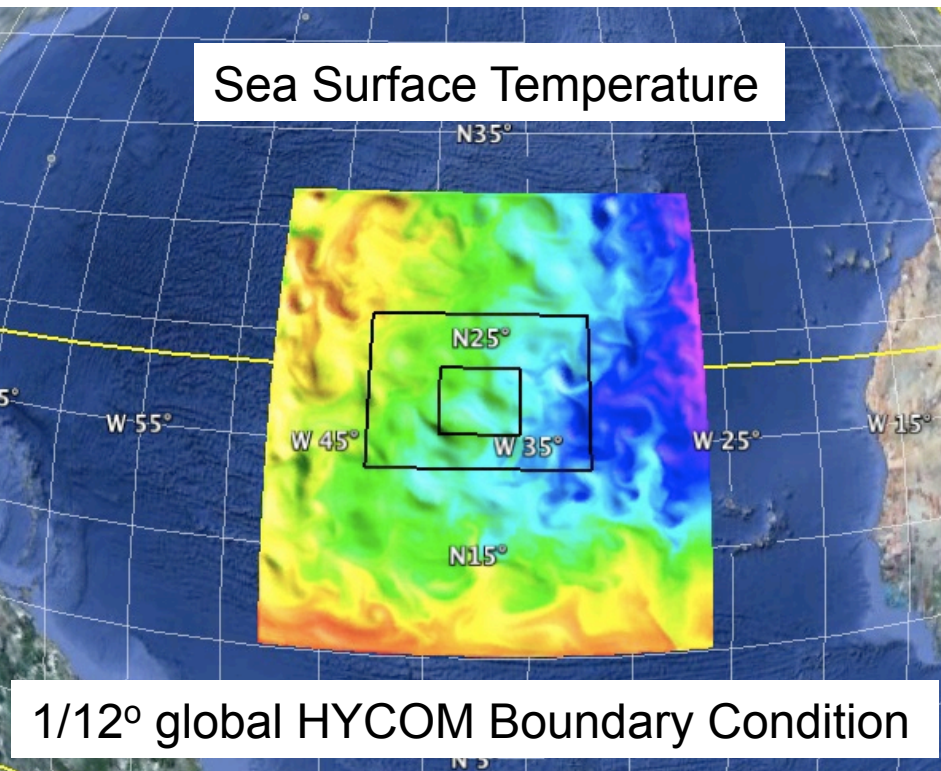
## Objectives:

1. Conduct Observing System Simulation Experiments (OSSEs) before the SPURS field campaign
2. Provide real-time nowcasts and forecasts during the SPURS field campaign to support decision making
3. Produce a reanalysis assimilating all the SPURS and other observational data into the nested model to study the processes controlling the upper ocean salinity.

## SSS Diagnostics

$$\underbrace{h \frac{\partial \langle S \rangle}{\partial t}}_a = \underbrace{-h \langle \vec{u} \rangle \cdot \nabla \langle S \rangle}_{b} - \underbrace{\nabla \cdot \int_{-h}^0 \hat{\vec{u}} \hat{S} dz}_c - \underbrace{(\langle S \rangle - S_{-h}) \left( \frac{\partial h}{\partial t} + \vec{u}_{-h} \cdot \nabla h + w_{-h} \right)}_d + \underbrace{(E - P) S_0}_e + \underbrace{SSM}_f$$

# SPURS Nested-Domain Modeling (based on ROMS), Data Assimilation & Hindcast/Nowcast/Forecast/Reanalysis



## ROMS model/data-assimilation system for:

- ✓ Situation awareness: what are the oceanographic conditions near my platform?
- ✓ OSSE experiments to help the design and/or refinement of sampling strategy (e.g., drifter release from Strasse in July north-east of the SPURS box)